UNIT-II

Research Problems, Variable and Operational Definition, Hypothesis,

Research Problem

A research problem is a specific issue, difficulty, contradiction, or gap in knowledge that you will aim to address in your research. You might look for practical problems aimed at contributing to change, or theoretical problems aimed at expanding knowledge.

A research problem is manifested in at least three ways-

i. A noticeable gap in the results of several investigations in the same field
ii. Contradictory results of several investigations same field.
iii. Isolated facts found unexplained

Important characteristics of problem-

1. A problem statement is written clearly and unambiguously, usually in question form.

Example- What is the relationship between intelligence and anxiety among school children?

2. A problem statement expresses the relationship between two or more than two variables.
   Example – Is higher IQ related to classroom achievement?

3. A problem method should be tested by empirical method.

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Variables

A variable as the name implies, is something which varies.
"Variables are the characteristics or conditions that are manipulated, controlled or observed by the experimenter.
Example- Intelligence, Anxiety, Aptitude, income etc.

Classification of Variables

1. Dependent and Independent Variables
2. Qualitative Variables and Quantitative Variables
3. Continuous Variables and Discrete Variables
4. Moderator Variables and Intervening Variables
5. Active Variables and Attribute Variables

1. Dependent Variables and Independent Variables

The dependent variable is defined as one about which the experimenter makes a prediction.

The independent variable is defined as one which is manipulated, measured and selected by the experimenter for the purpose of observable changes in the behavioural measure.

Example- Effect of teaching methods upon the classroom achievement

Floor and Ceiling Effect

A floor effect is said to have occurred where a null result occurs because majority of subject score at the very bottom end of the scale.

Ceiling effect are said to have occurred when subjects score too close to the top of the scale simply because the ask was too easy.

2. Qualitative Variable and Quantitative Variables

Qualitative variables comprise the categories which don't have a quantitative relationship among themselves, or we can say those variables which consist of categories that can not be ordered in magnitude.

Example- Gender, Race and Religion

(These are least preferable in scientific research because they cannot be measured accurately and can't be ordered in magnitude.

The quantitative variables are those variables which comprise the categories and can be ordered in magnitude.

Example- Age, Intelligence, Intensity of Light, sound etc.

3. Continuous and Discrete Variables.

There are 2 categories of quantitative variables-continuous and discrete variables

A continuous variable is one which is capable of being measured in any arbitrary degree of fineness or exactness.

Example- Age, Height, Intelligence, reaction time.

The discrete variables also known as categorical variables are those variables which are not capable of being measured in any arbitrary degree of fineness or exactness because the variables contain a clear gap.

Example- Numbers of children in family, gender, etc.

4. Active Variables and Attribute variables

A variable which can be manipulated by experimenter is active variable and variable which cannot be manipulated by the experimenter is attribute variable.

Example of active variables-reward punishment, method of teaching

Example of attribute variables- Age, Gender, Intelligence etc.

Hypothesis

"A conjectural statement of the relation between two or more variables. hypotheses are always in declarative sentence form and they relate either generally or specifically". Kerlinger

A hypothesis is a tentative answer to a research problem that is advanced so that it can be tested.

Characteristics of a Good Hypothesis-

- ✓ It Should be conceptually clear
- ✓ It must be testable
- ✓ It should relate to existing body of theory and fact
- ✓ It should have logical unity and comprehensiveness

Types of Hypotheses

- ✓ **Research Hypothesis**
- ✓ **Null Hypothesis**

1. The alternative hypothesis states that there is a relationship between the two variables being studied (one variable has an effect on the other).

It states that the results are not due to chance and that they are significant in terms of supporting the theory being investigated.

2. The null hypothesis states that there is no relationship between the two variables being studied (one variable does not affect the other).

It states results are due to chance and are not significant in terms of supporting the idea being investigated.